

TOSHIBA

SERVICE MANUAL

LARGE CAPACITY FEEDER

KD-1012

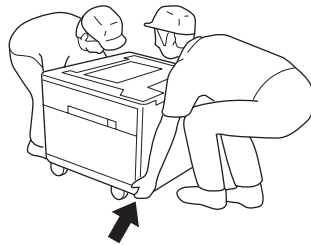


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GENERAL PRECAUTIONS FOR INSTALLATION/SERVICING/MAINTENANCE

- 1) When installing the Large Capacity Feeder KD-1012 to the equipment, be sure to follow the instructions described in the "Unpacking/Set-Up Procedure for the KD-1012" booklet which comes with each unit of the KD-1012.
- 2) The KD-1012 should be installed by an authorized/qualified person.
- 3) When transporting/installing the KD-1012, employ two persons and be sure to use the positions as indicated below. The KD-1012 is fairly heavy and weights approximately 27 kg (59.5 lb.), therefore pay full attention when handling it.



- 4) Before starting installation, servicing or maintenance work, be sure to turn OFF and unplug the equipment first.
- 5) The KD-1012 is supplied with power from the equipment, requiring no additional power source.
- 6) The KD-1012 should be grounded to the specified positions on the machine frame.
- 7) When servicing or maintaining the KD-1012, be careful about the rotating or operating sections such as gears, pulleys, sprockets, cams, belts, etc.
- 8) When servicing the machines with the power turned ON, be sure not to touch live sections and rotating / operating sections.
- 9) When parts are disassembled, reassembly is basically the reverse of disassembly unless otherwise noted in this manual or other related documents. Be careful not to reassemble small parts such as screws, washers, pins, E-rings, toothed washers to the wrong places.
- 10) Basically, the machine should not be operated with any parts removed or disassembled.
- 11) Delicate parts for preventing safety hazard problems (such as thermofuses, door switches sensors, etc. if any) should be handled/installed/adjusted correctly.
- 12) During servicing or maintenance work, be sure to check the nameplate and other cautionary labels (if any) to see if they are clean and firmly stuck. If not, take appropriate actions.
- 13) Use suitable measuring instruments and tools.
- 14) The PC board must be stored in an anti-electrostatic bag and handled carefully using a wristband, because the ICs on it may be damaged due to static electricity.

Caution: Before using the wrist band, pull out the power cord plug of the equipment and make sure that there is no uninsulated objects in the vicinity.

15) For the recovery and disposal of used the large capacity feeder, consumable parts, packing materials, follow the relevant local regulations/rules.

16) Return the equipment to the original state and check the operation when the service is finished.

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1. SPECIFICATIONS

Feeding method	Tandem tray
Paper	Size: A4, LT Thickness: 64 - 105 g/m ² (17 - 28 lb. Bond)
Capacity of drawer	Stack height: 137.5 mm (5.41 inch) Approx. 1250 x 2 sheets (80 g/m ² (22 lb. Bond))
Dimensions	530 (W) × 577 (D) × 282 (H) mm (Height - Floor to top of front cover) 20.87 (W) × 22.72 (D) × 11.10 (H) inch (Height - Floor to top of front cover) (623 (W) × 657 (D) × 282 (H) mm: Including the stabilizer cover) (24.53 (W) × 25.87 (D) × 11.10 (H) inch: Including the stabilizer cover)
Weight	Approx. 27 kg (59.5 lb.)
Power supply	5V, 24V (supplied from the equipment)

2. OVERVIEW

2.1 Front Sectional View

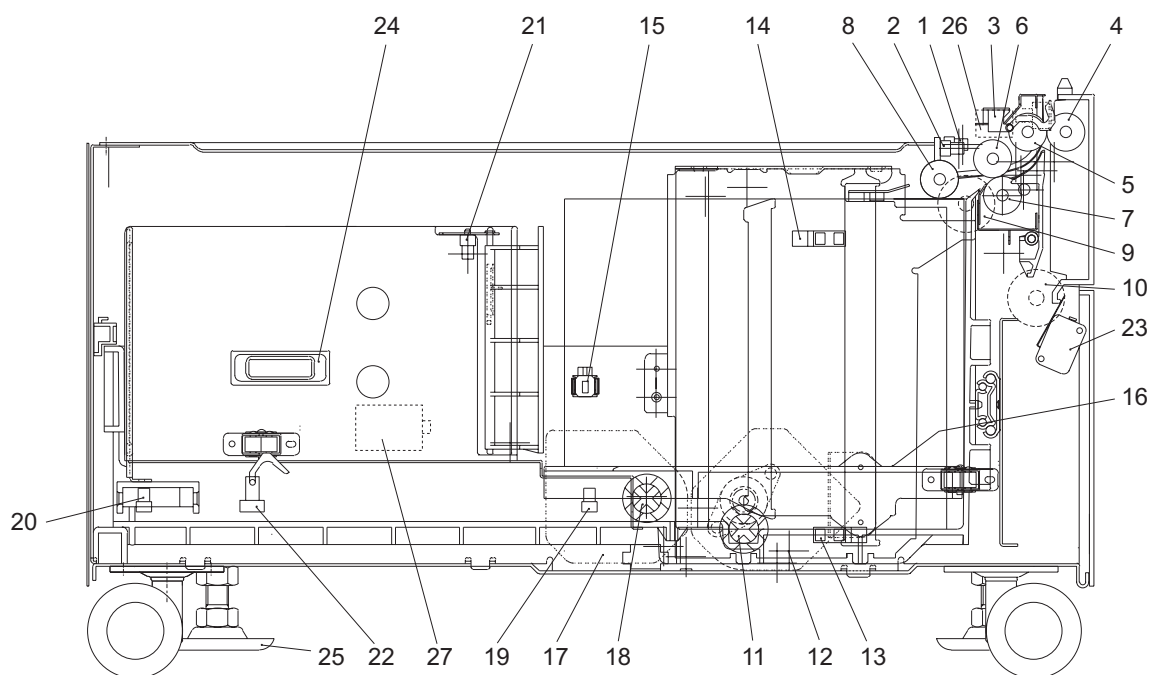


Fig. 2-1

No.	Name	No.	Name
1	Tray-up sensor (S3)	15	Drawer detection switch (S10)
2	Feeding side paper empty sensor (S7)	16	Elevator tray
3	Drawer feed sensor (S2)	17	End fence motor (M3)
4	Side cover roller	18	End fence coupling
5	Transport roller	19	End fence stop position sensor (S5)
6	Feed roller	20	End fence home position sensor (S6)
7	Separation roller	21	Standby side paper mis-stacking sensor (S11)
8	Pickup roller	22	Standby side empty sensor (S8)
9	Feed clutch (C2)	23	Side cover opening/closing switch (S1)
10	Transport clutch (C1)	24	Drawer connector
11	Tray-up coupling	25	Adjuster
12	Tray-up motor (M2)	26	Pickup solenoid (SOL1)
13	Tray bottom sensor (S4)	27	End fence solenoid (SOL2)
14	Feeding side paper stock sensor (S9)		

2.2 Layout of Electrical Parts

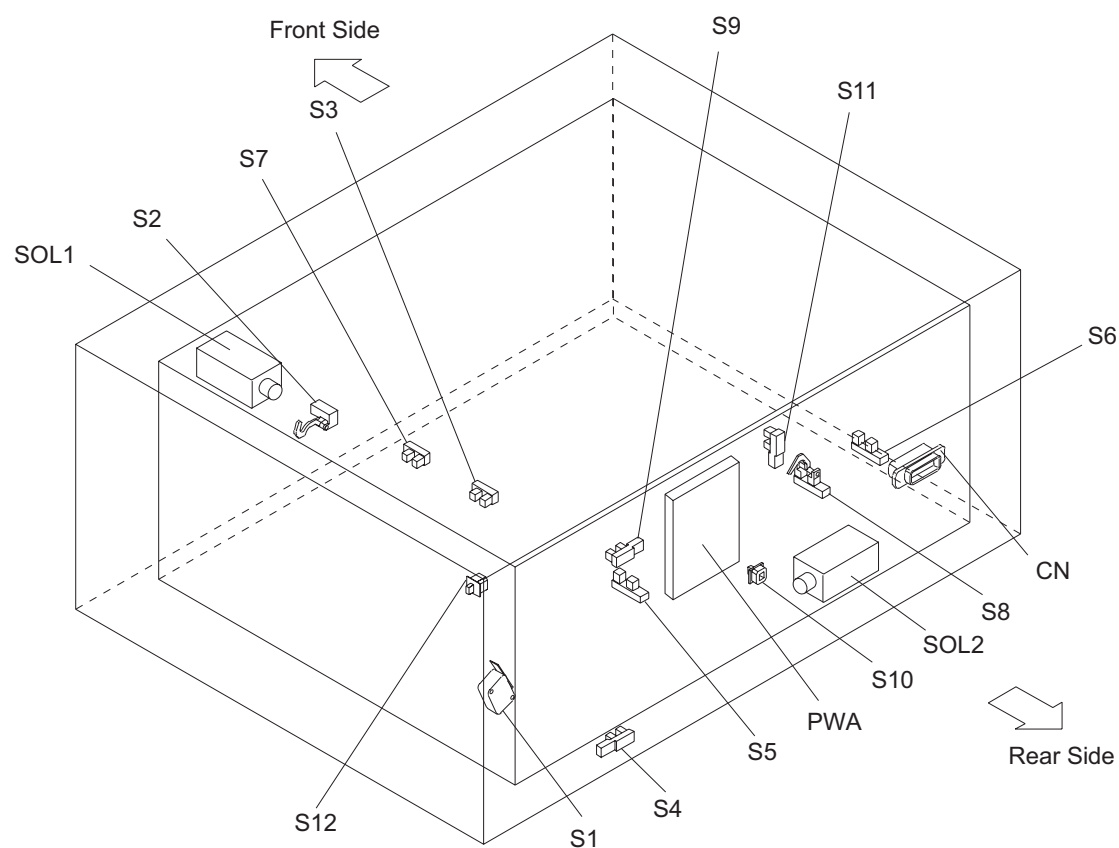


Fig. 2-2

No.	Name	No.	Name
S1	Side cover opening/closing switch <24V>	S9	Feeding side paper stock sensor
S2	Drawer feed sensor	S10	Drawer detection switch
S3	Tray-up sensor	S11	Standby side paper mis-stacking sensor
S4	Tray bottom sensor	S12	Side cover opening/closing switch <5V>
S5	End fence stop position sensor	PWA	PC board
S6	End fence home position sensor	SOL1	Pickup solenoid
S7	Feeding side paper empty sensor	SOL2	End fence solenoid
S8	Standby side empty sensor	CN	Drawer connector

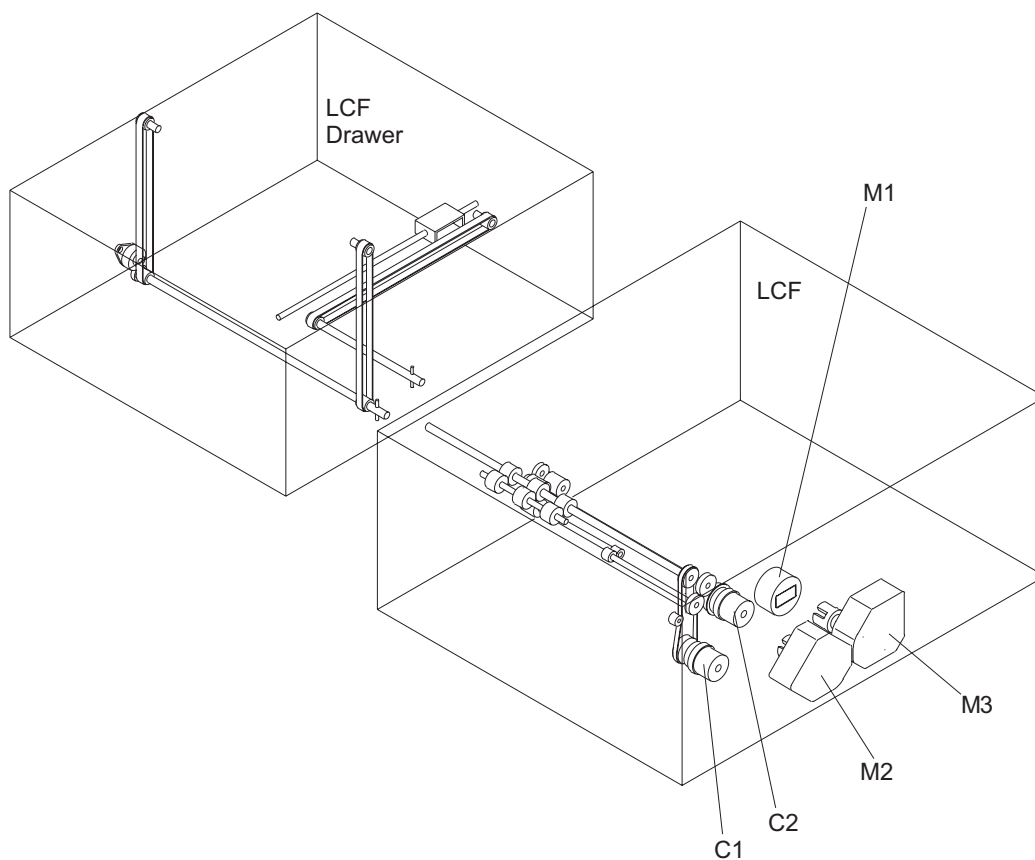


Fig. 2-3

No.	Name	No.	Name
M1	LCF transport motor	C1	Transport clutch
M2	Tray-up motor	C2	Feed clutch
M3	End fence motor		

2.3 Electrical Parts

1) Motor

Symbol	Name	Function	Remarks
M1	LCF-MTR LCF transport motor	Drives feeding and transporting	Brushless motor
M2	T-UP-MTR Tray-up motor	Lifts up the elevator tray	Brush motor
M3	END-F-MTR End fence motor	Drives the movement of the end fence	Brush motor

2) Electromagnetic clutch

Symbol	Name	Function	Remarks
C1	TR-CLT Transport clutch	Drives the transporting	
C2	FED-CLT Feed clutch	Drives the feeding	

3) Switches or sensors

Symbol	Name	Function	Remarks
S1	SIDE-COV-SW Side cover opening/closing switch <24V>	Side cover opening/closing detection for interlock	Push switch
S2	FED-SNR Drawer feed sensor	Detects paper misfeeding	Photo interrupter
S3	TOP-SNR Tray-up sensor	Detects if the elevator tray has been raised	Photo interrupter
S4	TRY-BTM-SNR Tray bottom sensor	Detects the home position of the elevator tray	Photo interrupter
S5	END-F-STP-SNR End fence stop position sensor	Detects the stop position of the end fence	Photo interrupter
S6	END-F-HP-SNR End fence home position sensor	Detects the home position of the end fence	Photo interrupter
S7	EMP-SNR-FS Feeding side paper empty sensor	Detects lack of paper of the feeding side	Photo interrupter
S8	EMP-SNR-SS Standby side paper empty sensor	Detects lack of paper of the standby side	Photo interrupter
S9	PST-SNR-FS Feeding side paper stock sensor	Detects that the paper stock is insufficient	Photo interrupter
S10	CST-SW Drawer detection switch	Detects the availability of the drawer	Push switch
S11	PR-MST-SS Standby side paper mis-stacking sensor	Detects mis-stacking of paper in the standby side drawer	Photo interrupter
S12	SIDE-COV-SW Side cover opening/closing switch <5V>	Side cover opening/closing detection	Push switch

4) PC board

Symbol	Name	Function	Remarks
PWA	PWA-F-PFP-569 PC board	Control of LCF devices	

5) Solenoids

Symbol	Name	Function	Remarks
SOL1	PICKUP-SOL Pickup solenoid	Lifts up the pickup roller	
SOL2	END-F-SOL End fence solenoid	Moves the lever to detect mis-stacking of paper in the standby side drawer	

3. GENERAL OPERATION

3.1 Configuration and Drive System

The Large Capacity Feeder (LCF) mainly consists of the LCF drawer, pickup roller, feed roller, separation roller, transport roller and drive system for these components.

- Feeding/Transport system
The LCF transport motor drives the pickup roller, feed roller, and transport roller which are located in the feeding area.
- Drawer tray system
This system raises and lowers the tray.
- End fence system
This system moves of the end fence.

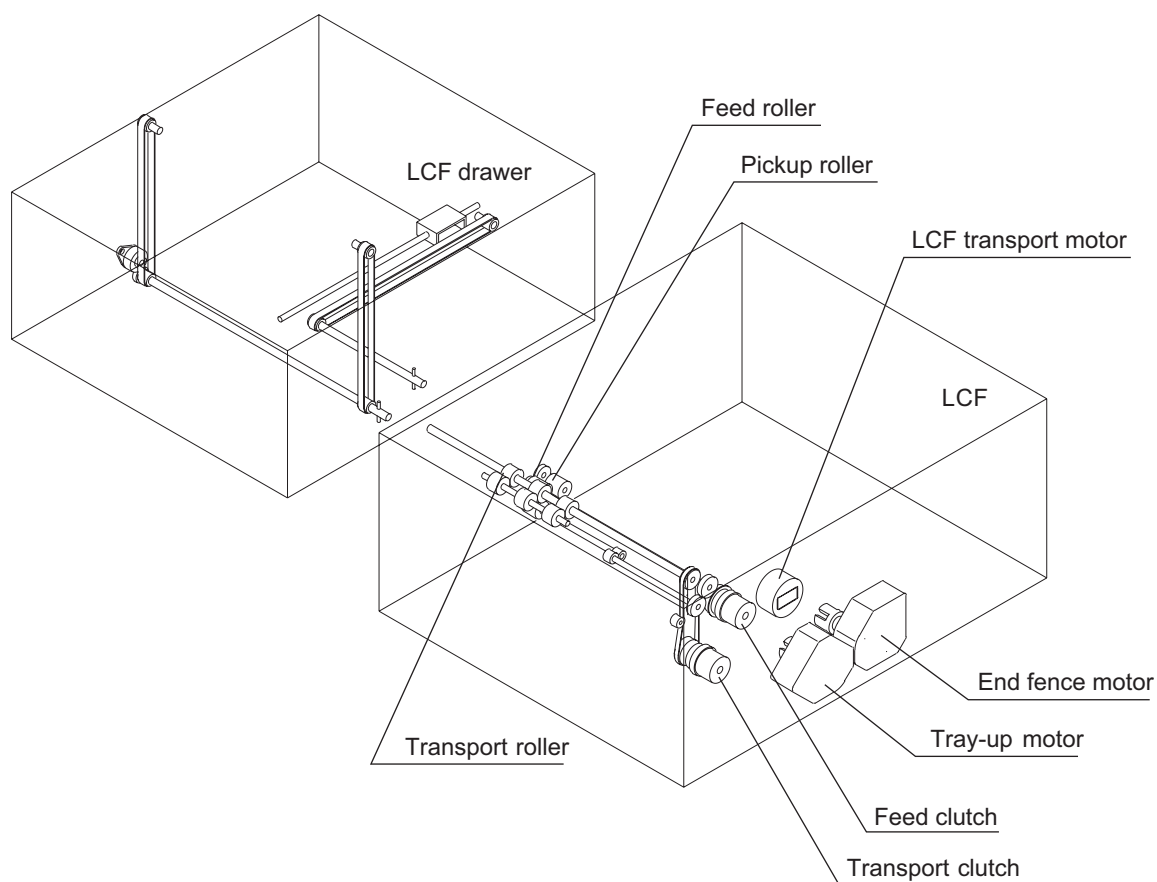


Fig. 3-1

3.2 Description of Operation

[A] From power ON to ready

- (1) When the equipment is turned ON, power is also supplied to the feeder unit to start the pre-running operation. The tray-up motor (M2) starts to rotate forward and raises the tray. The tray-up motor (M2) is turned OFF when the tray turns ON the tray-up sensor (S3), then the tray is stopped. At this time, it is judged that there is paper in the feeding side tray when the feeding side empty sensor (S7) is ON. On the other hand, the absence of paper in the feeding side tray is assumed when the sensor (S7) is OFF, and the standby side empty sensor (S8) is subsequently checked. When the standby side empty sensor (S8) is OFF, that means there is no paper in the standby side tray, and it is therefore assumed that there is no paper in the LCF. When the standby side empty sensor (S8) is ON, the paper in the standby side tray is moved to the feeding side tray. The tray-up motor (M2) is rotated in reverse and lowers the tray of the feeding side. The lowered tray turns ON the tray bottom sensor (S4), and the tray-up motor (M2) is turned OFF to stop the tray. The end fence solenoid (SOL2) and pickup solenoid (SOL1) are then turned ON. The end fence motor (M3) rotates forward and the paper in the standby side tray is moved onto the tray of the feeding side. The end fence motor (M3) is stopped for a second when the end fence stop position sensor (S5) is turned ON, and the motor (M3) immediately starts to rotate in reverse to return the end fence to the position where the home position sensor (S6) is turned ON. When the returning operation is started, the end fence solenoid and pickup solenoid are turned OFF, and the tray-up motor (M2) is rotated forward to raise the tray. The tray-up motor (M2) is turned OFF when the tray being raised turns ON the tray-up sensor (S3) and stops the tray. At this time, the presence of paper is judged when the feeding side empty sensor (S7) is ON.
- (2) If the power is turned ON when the drawer has been removed, the tray lifting movement is not operated. The tray is raised as soon as the drawer is installed, and it detects if there is paper in the drawer.
- (3) If either of the drawer feed sensors (S2) is ON (there is paper in the transport path) when the power is turned ON, that means a paper jam has occurred and the operation is disabled until the paper is removed.

[B] Ready status

- (1) Trays detect the paper as described in [A], and the equipment goes into the ready status.
- (2) The tray goes down automatically when the drawer is removed and is raised as soon as the drawer is reinstalled then checks if there is paper in the drawer.

[C] From the start to the end of copying

- (1) The main motor of the equipment is turned ON when the [START] button is pressed. The LCF transport motor (M1) is turned ON to drive.
- (2) When the equipment judges that the LCF is ready for feeding paper, it turns ON the feed clutch (C2) of the selected drawer. This clutch drives the pickup roller and feed roller to feed paper from the tray.
- (3) The transport clutch (C1) is turned ON to drive the LCF transport roller when the specified period of time has passed from the start of feeding.
- (4) The leading edge of the paper turns the drawer feed sensor (S2) ON. The feed clutch (C2) is turned OFF and feeding from the drawer is completed.

- (5) The paper is transported to the equipment by the LCF transport roller. If the trailing edge of the sheet previously transported still remains at the drawer feed sensor (S2) of the equipment when the leading edge of the paper reaches the drawer feed sensor (S2), the transport clutch (C1) is turned OFF to stop the transport of the paper.
- (6) The trailing edge of the paper turns the drawer feed sensor (S2) OFF. LCF then becomes ready for feeding the next sheet of paper, and the procedures (2) to (5) are repeated.
- (7) When the copying operation is completed, the main motor and LCF transport motor (M1) are turned OFF.

3.3 Error Detection

[A] Jam detection

- (1) A paper jam (E190, E3C0, E3D0, E3E0) occurs in the following cases.
 - Drawer feed sensor (S2) is not turned ON within a specified period of time after the feeding is started.
 - The leading edge of the paper does not pass the drawer feed sensor (S2) in the transport path within a specified period of time.
- (2) Open the side cover of the LCF, remove all the paper remaining on the transport path and close the side cover to clear the paper jam. If either of the drawer feed sensors (S2) is still ON when the side cover is closed, it is determined that there is still paper on the transport path and the paper jam status is not cleared.
- (3) When a paper jam occurs in the LCF during continuous copying, the sheet that was fed before the jam is copied normally.

[B] Call for Service

- (1) When the tray-up sensor (S3) is not turned ON even though the specified period of time has passed since the tray started to be raised, it is assumed that the drawer is not operational and the corresponding message is displayed on the control panel.
- (2) When the tray bottom sensor (S4) is not turned ON even though the specified period of time has passed since the tray started to be lowered, it is assumed that the drawer is not operational and the corresponding message is displayed on the control panel.
- (3) When the end fence stop position sensor (S5) is not turned ON even though the specified period of time has passed since the end fence started to move the paper in the standby side drawer, it is assumed that the drawer is not operational and the corresponding message is displayed on the control panel.
- (4) When the end fence home position sensor (S6) is not turned ON even though the specified period of time has passed since the end fence started to move the paper in the standby side, it is assumed that the drawer is not operational and the corresponding message is displayed on the control panel.
- (5) The states (1) to (4) are cleared by turning the power OFF and solving the problems.

3.4 Flow Chart

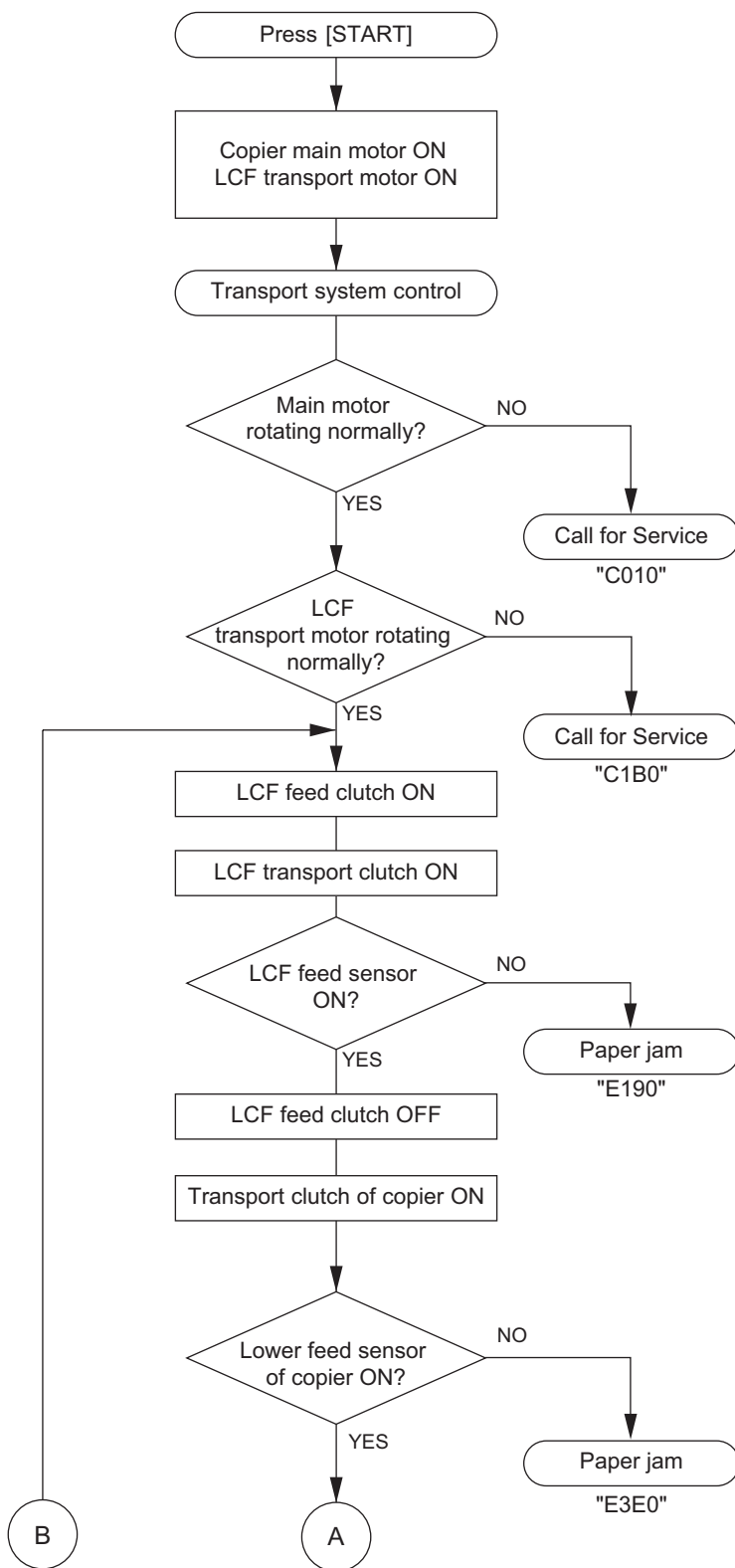


Fig. 3-2

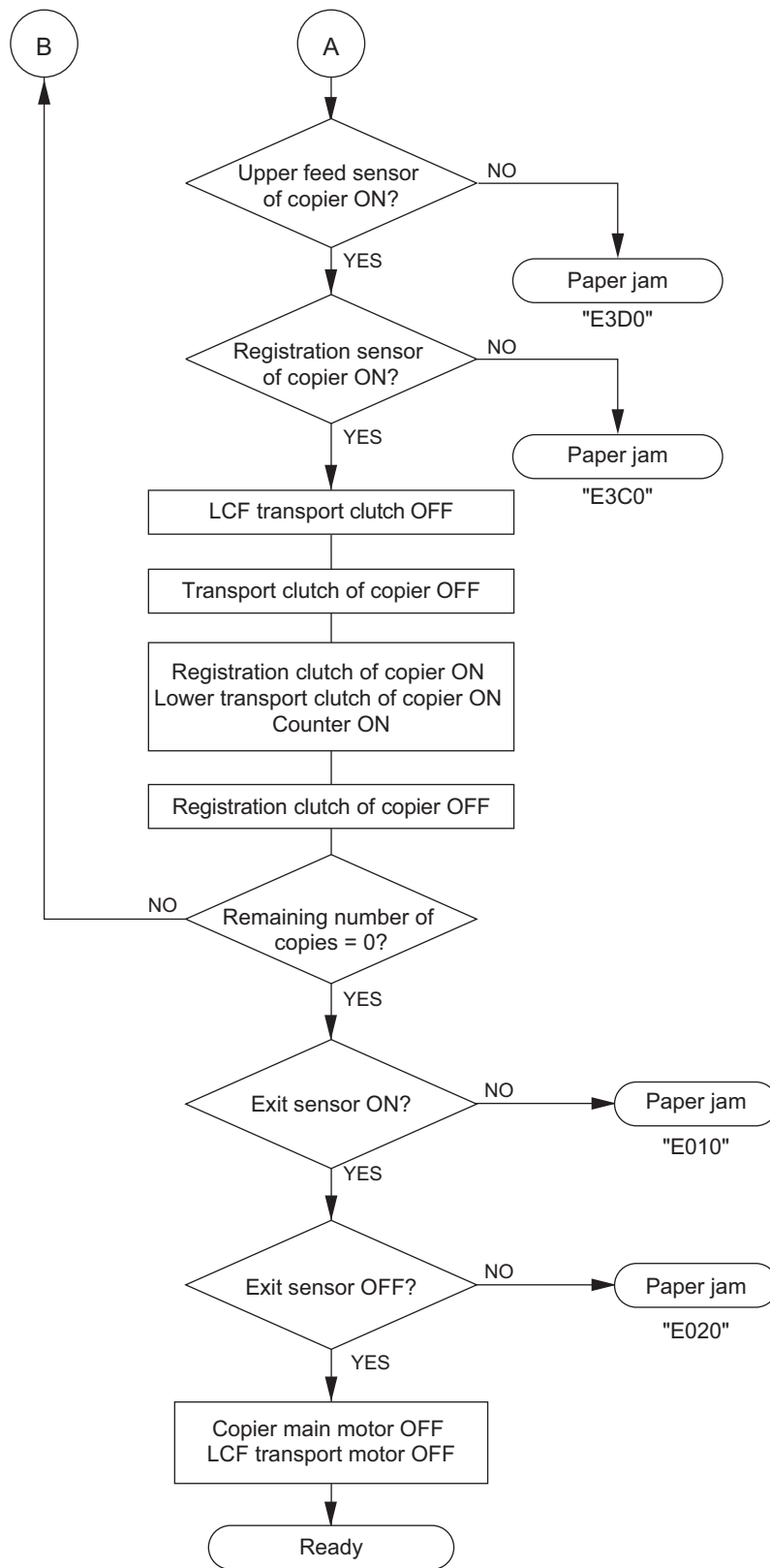


Fig. 3-3

4. DISASSEMBLY AND REPLACEMENT

4.1 Top cover

- (1) Remove 5 screws and take off the top cover.

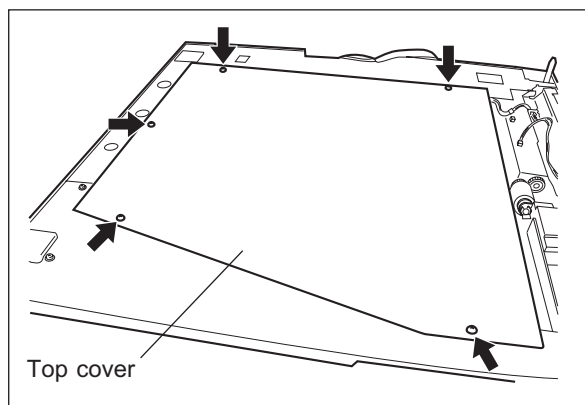


Fig. 4-1

4.2 Installation and Removal of the LCF Drawer and Covers

[A] LCF drawer

- (1) Draw out the LCF drawer toward you.
- (2) Remove 1 screw and take off the stopper bracket at the left side of the LCF drawer.

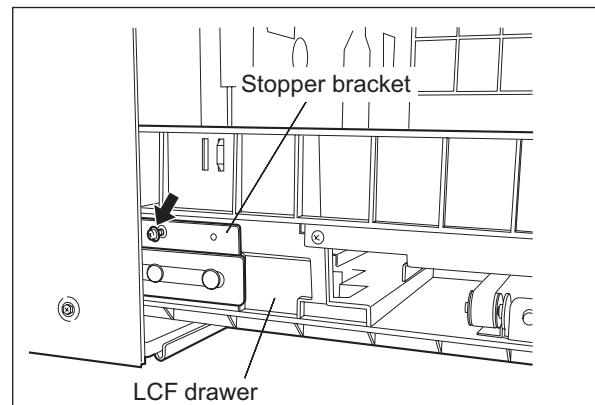


Fig. 4-2

- (3) Pull out the LCF drawer while pressing the plate spring at the right side of the LCF drawer.

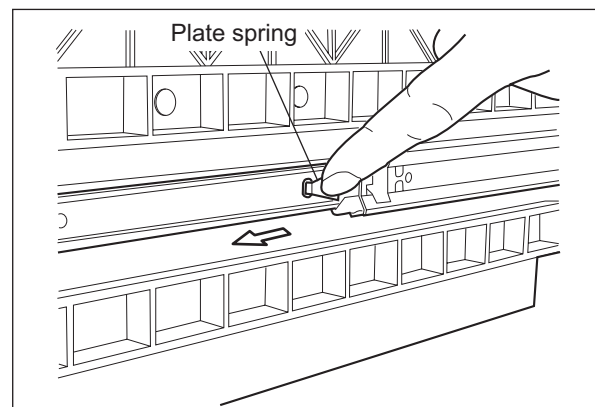


Fig. 4-3

[B] Front cover

- (1) Remove 2 screws and take off the front cover.

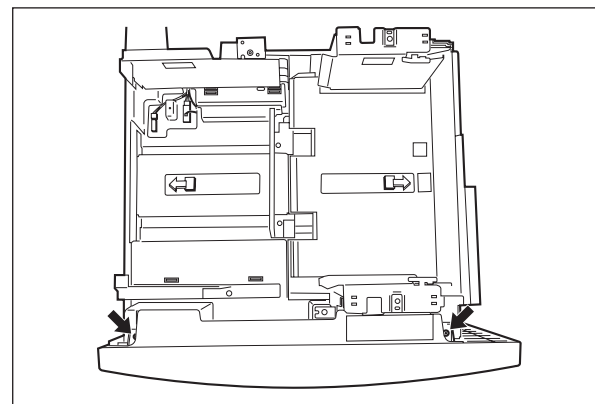


Fig. 4-4

[C] Stabilizer cover

- (1) Remove 2 screws and take off the feeding side stabilizer cover.
- (2) Remove 2 screws and take off the rear side stabilizer cover.

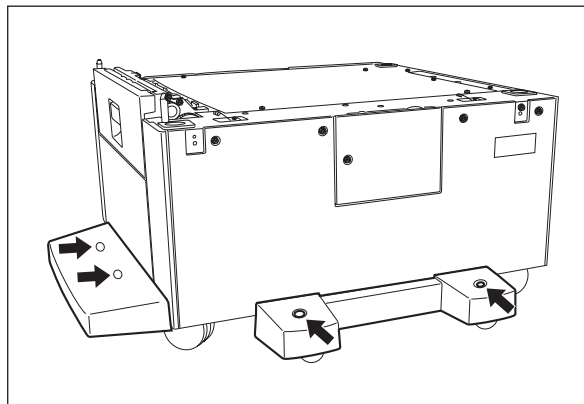


Fig. 4-5

[D] Rear cover

- (1) Take off the rear side stabilizer cover (P. 4-3 "[C] Stabilizer cover").
- (2) Remove 4 screws and take off the rear cover.

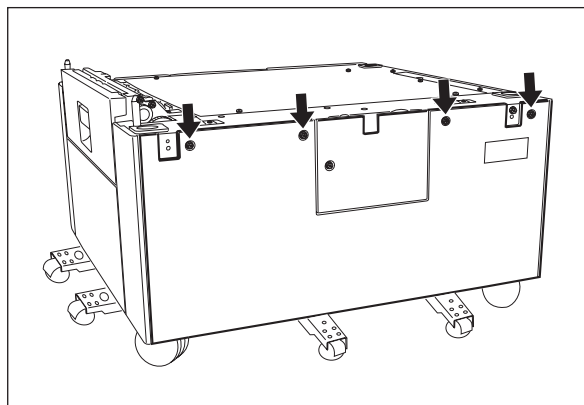


Fig. 4-6

[E] Feeding side rear cover

- (1) Remove the rear cover (P. 4-3 "[D] Rear cover").
- (2) Remove 2 screws and take off the feeding side rear cover.

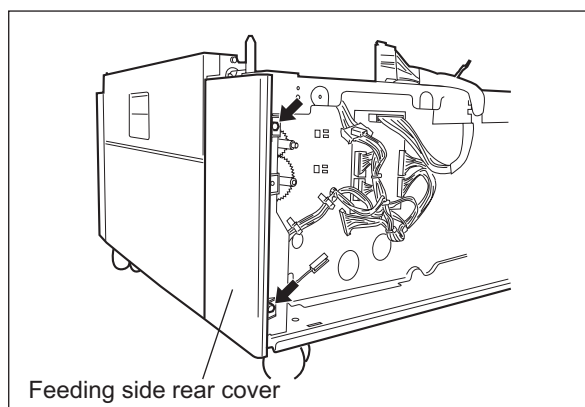


Fig. 4-7

[F] Feeding side front cover

- (1) Take off the feeding side stabilizer cover (P. 4-3 "[C] Stabilizer cover").
- (2) Remove 2 screws and take off the feeding side front cover.

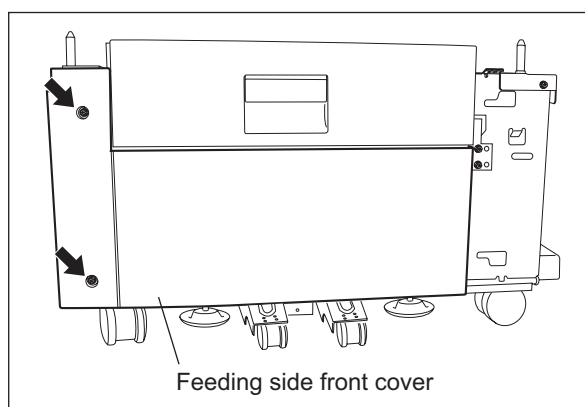


Fig. 4-8

[G] Side cover

- (1) Open the side cover and take out the fulcrum (protrusion) of the front side of the side cover out of the hole of the frame while pushing the cover to the rear side.
- (2) Remove the side cover.

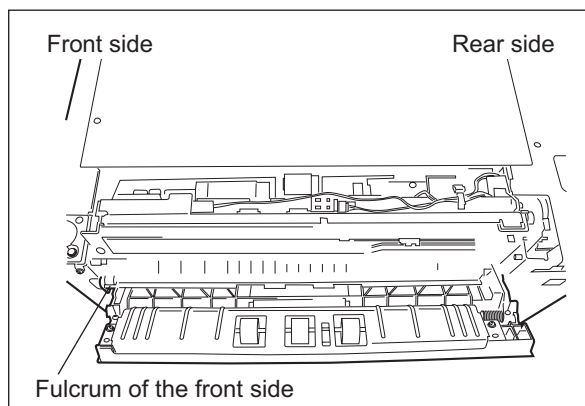


Fig. 4-9

4.3 Paper Guides

[A] Feeding side front guide

- (1) Remove 1 screw fixing the feeding side front guide.
- (2) Lift up the paper guide slightly and place it into the slots for the appropriate size. Confirm the position of the screw hole and insert a screw into it.

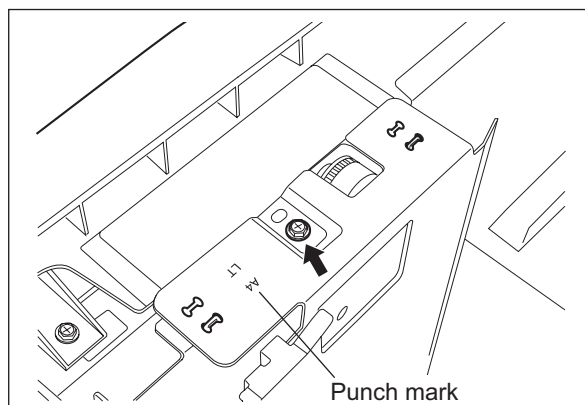


Fig. 4-10

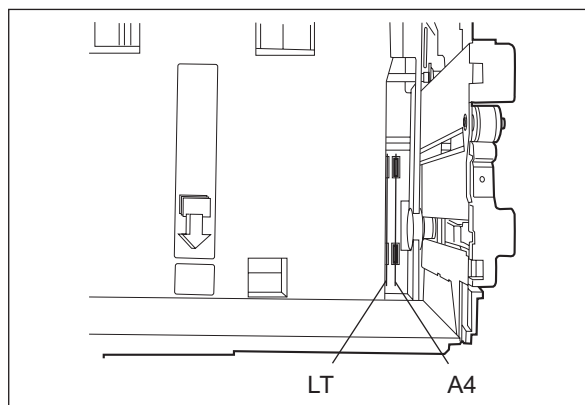


Fig. 4-11

[B] Feeding side rear guide

- (1) Remove 1 screw fixing the feeding side rear guide.
- (2) Lift up the paper guide slightly and place it into the slots for the appropriate size. Confirm the position of the screw hole and insert a screw into it.

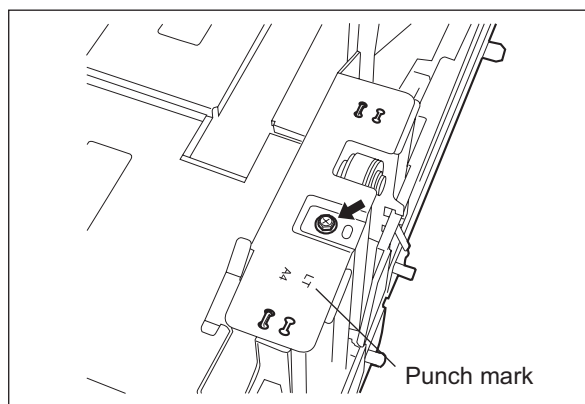


Fig. 4-12

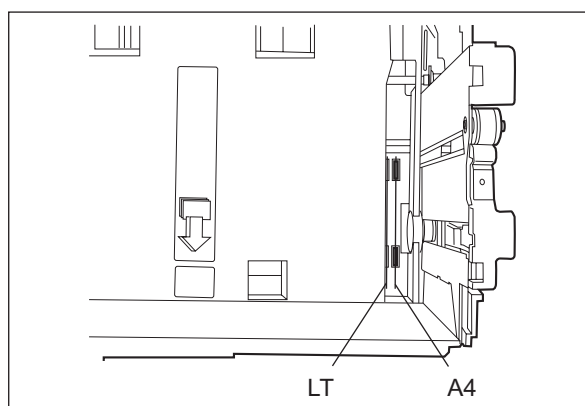


Fig. 4-13

[C] Standby side front guide

- (1) Remove 1 screw fixing the standby side front guide and slide the guide in the direction of the white arrow.
- (2) Lift up the paper guide slightly and place it into the slots for the appropriate size. Confirm the position of the screw hole and insert a screw into it.

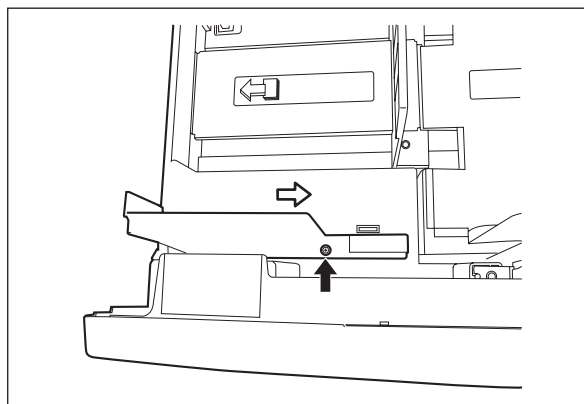


Fig. 4-14

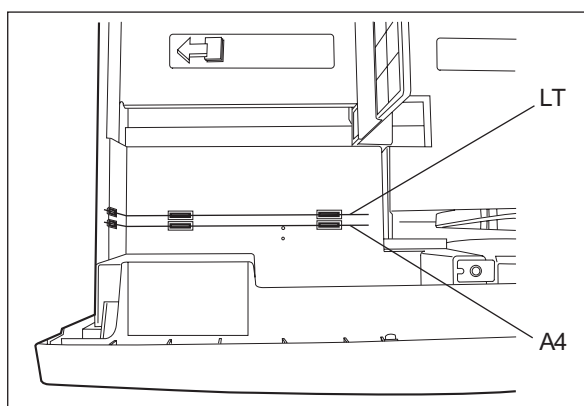


Fig. 4-15

[D] Standby side rear guide

- (1) Remove 1 screw fixing the standby side rear guide and slide the guide in the direction of the white arrow.
- (2) Lift up the paper guide slightly and place it into the slots for the appropriate size. Confirm the position of the screw hole and insert a screw into it.

Note:

When the position of the standby side rear guide is changed (A4→LT or LT→A4), remember that the direction of the rear guide stopper to be assembled is also changed (See the figures below).

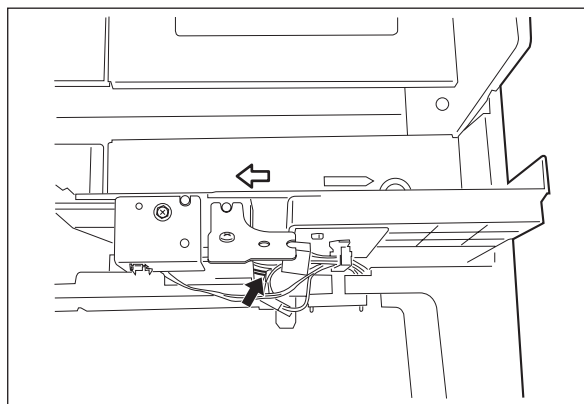


Fig. 4-17

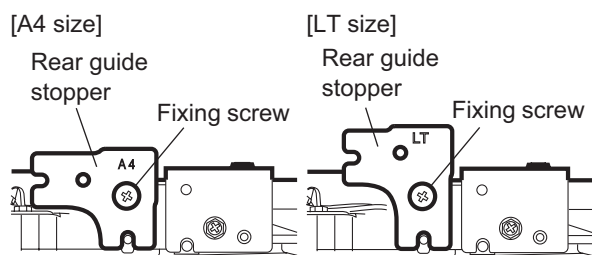


Fig. 4-16

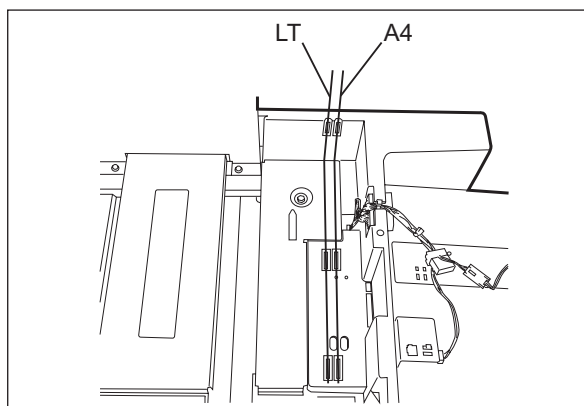


Fig. 4-18

4.4 Standby Side Paper Mis-stacking Sensor

- (1) Remove 1 screw and take off the sensor bracket.
- (2) Disconnect 1 connector.
- (3) Release the latches and take off the sensor.

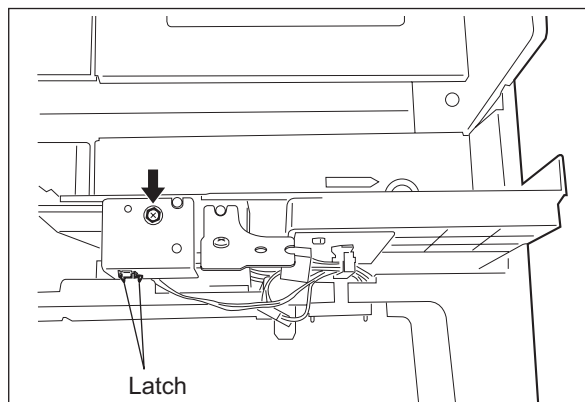


Fig. 4-19

4.5 End Fence Home Position Sensor / Standby Side Empty Sensor

- (1) Disconnect 1 connector, and release the harness from the clamp.
- (2) Remove 1 screw fixing the standby side rear guide, then slide the guide in the direction of the white arrow to take it out.

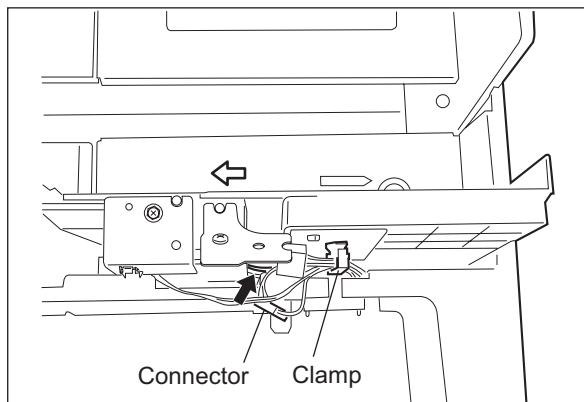


Fig. 4-20

- (3) Remove 1 screw and take off the bracket.

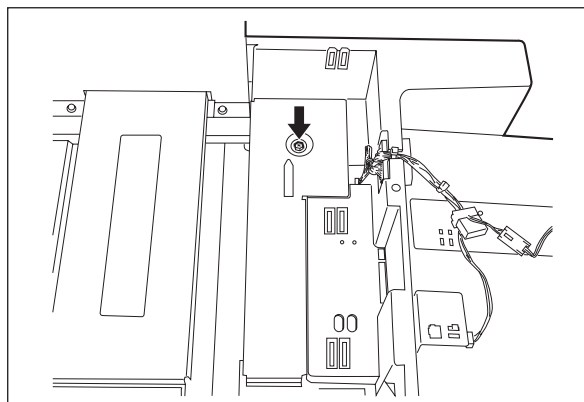


Fig. 4-21

- (4) Disconnect the connector.
- (5) Release the latch to remove the end fence home position sensor and the standby side paper empty sensor from the backside of the LCF drawer.

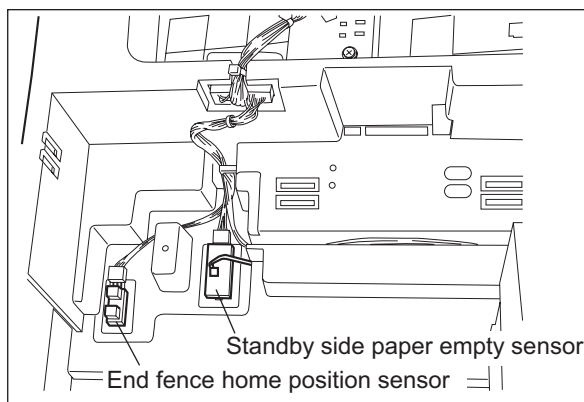


Fig. 4-22

4.6 End Fence Stop Position Sensor

- (1) Disconnect 1 connector, remove 1 screw and take off the bracket.
- (2) Release the latch to remove the sensor.

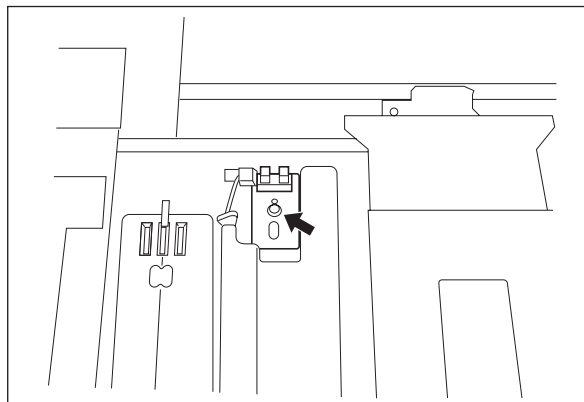


Fig. 4-23

Note:

Be careful the positions to attach the end fence stop position sensor differ in paper size.

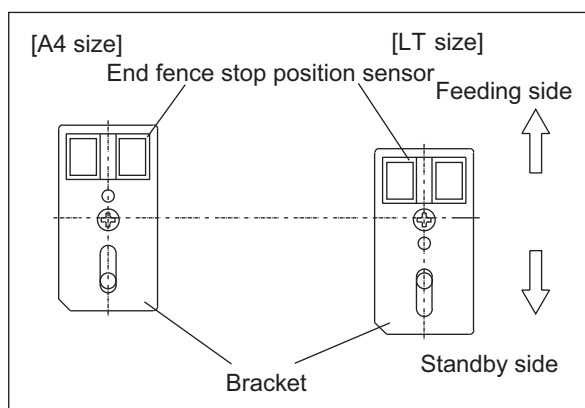


Fig. 4-24

4.7 LCF Transport Motor Unit

- (1) Take off the rear cover (P. 4-3 "[D] Rear cover").
- (2) Disconnect 1 connector.
- (3) Remove 3 screws and take off the LCF transport motor along with the bracket.

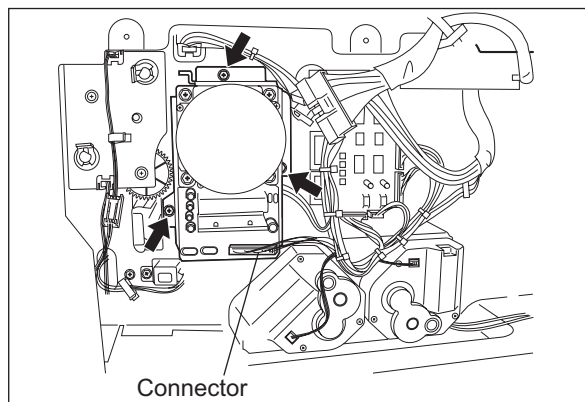


Fig. 4-25

- (4) Remove 4 screws and take off the motor from the bracket.

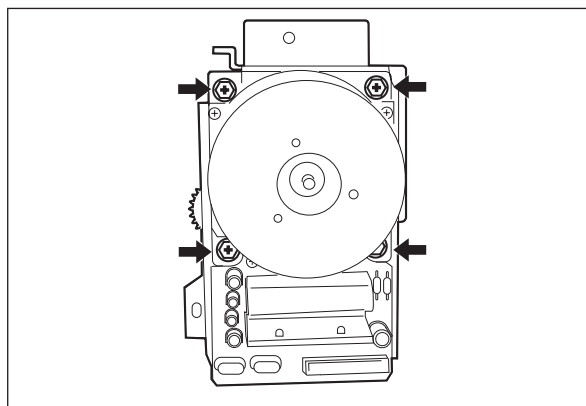


Fig. 4-26

4.8 PC Board

- (1) Take off the rear cover (P. 4-3 "[D] Rear cover").
- (2) Disconnect 8 connectors.
- (3) Remove 1 lock support and 3 screws. Take off the PC board.

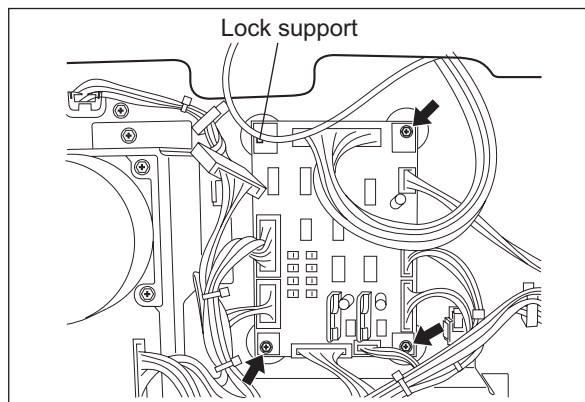


Fig. 4-27

4.9 Tray-up Motor / End Fence Motor

- (1) Take off the rear cover (P. 4-3 "[D] Rear cover").
- (2) Disconnect 2 connectors.
- (3) Remove 3 screws and take off the tray-up motor / end fence motor along with the bracket.

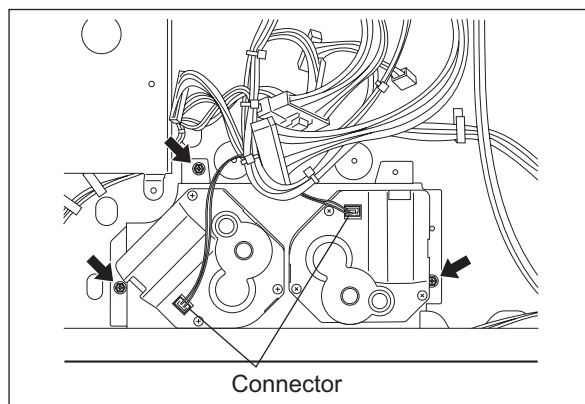


Fig. 4-28

- (4) Remove each 2 screws of both motors. Take off the tray-up motor and the end fence motor.

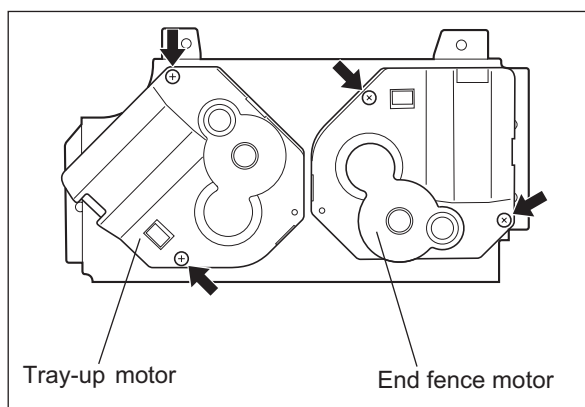


Fig. 4-29

4.10 Feed Clutch / Transport Clutch

- (1) Take off the rear cover (P. 4-3 "[D] Rear cover").
- (2) Release the harness from 3 clamps and disconnect 2 connectors.
- (3) Remove 2 clips and 2 screws. Take off the bracket.

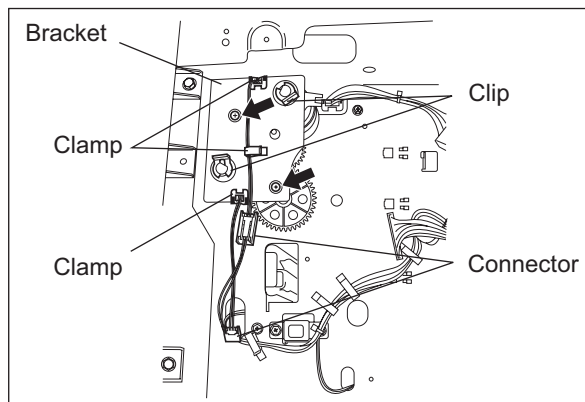


Fig. 4-30

- (4) Remove the feed clutch and transport clutch.

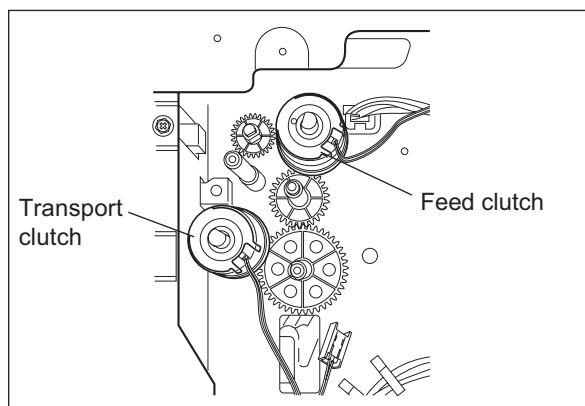


Fig. 4-31

4.11 Side Cover Opening/Closing Switch

- (1) Take off the feeding side rear cover and feeding side front cover (P. 4-4 "[E] Feeding side rear cover", P. 4-4 "[F] Feeding side front cover").
- (2) Disconnect 2 connectors.
- (3) Remove 2 screws and the plate spring for the tension pulley.
- (4) Remove the side cover opening/closing switch.

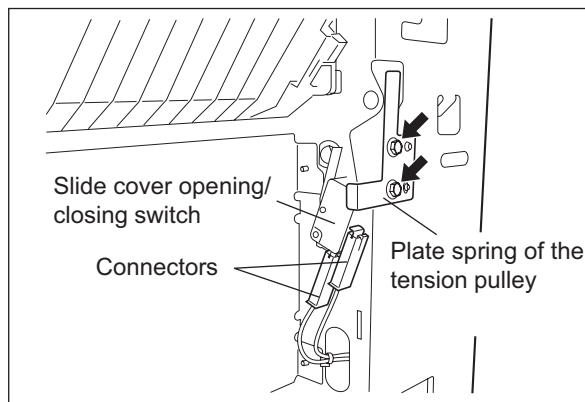





Fig. 4-32

4.12 Feeding Unit

[A] Feeding unit

- (1) Take off the feeding side rear cover, feeding side front cover and side cover.
( P. 4-4 "[E] Feeding side rear cover")
( P. 4-4 "[F] Feeding side front cover")
( P. 4-5 "[G] Side cover")
- (2) Remove 1 screw and pull out the side cover opening/closing lock pin for the feeding unit.

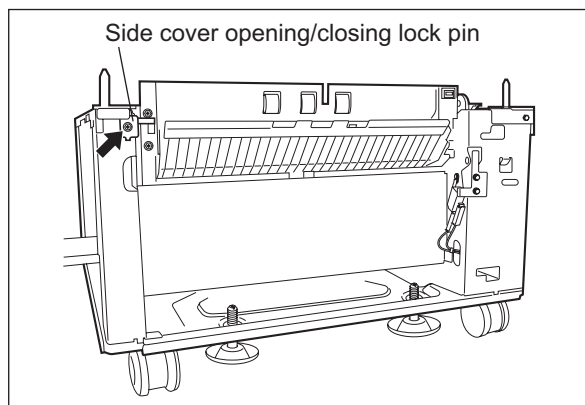


Fig. 4-33

- (3) Disconnect 2 connectors.

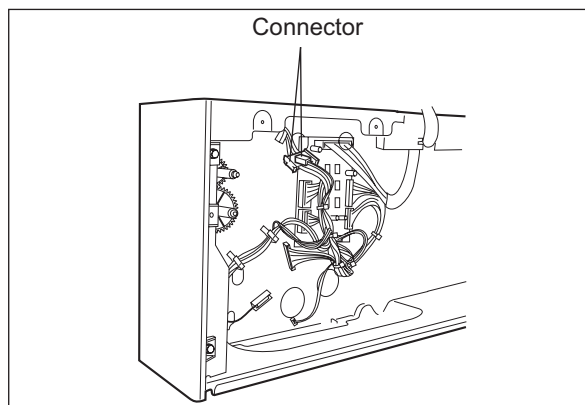


Fig. 4-34

- (4) Release the latch from the groove on the shaft, and take off the gear.
- (5) Remove the clip and take off the belt to remove the feeding unit drive gear.

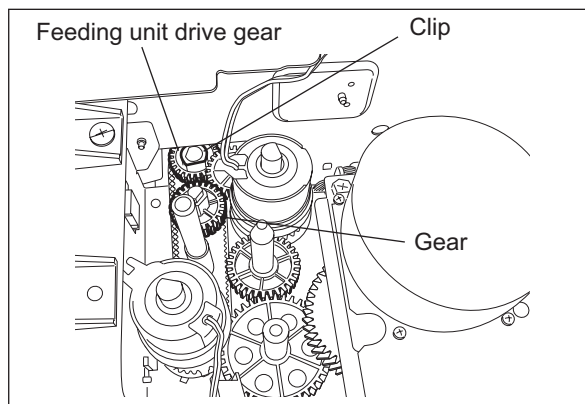


Fig. 4-35

- (6) Remove 2 screws fixing the feeding unit, and take off the unit upward while pushing it in the direction of the white arrow.

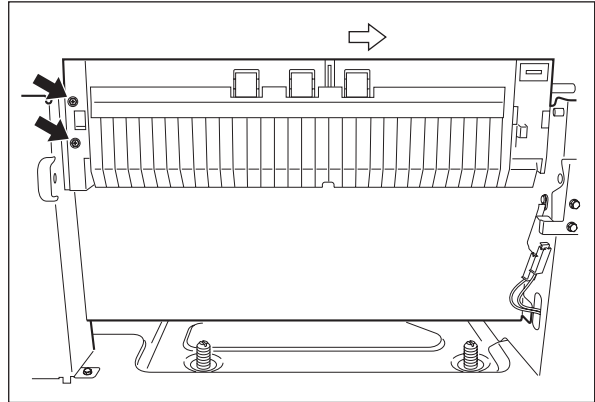


Fig. 4-36

[B] Drawer feed sensor

- (1) Take off the feeding unit (P. 4-18 "[A] Feeding unit").
- (2) Remove 1 screw and take off the sensor bracket.
- (3) Disconnect 1 connector and release the latch to remove the sensor.

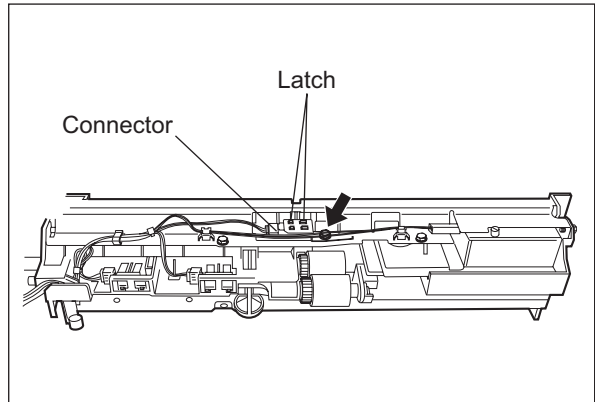


Fig. 4-37

[C] Feeding side paper empty sensor / Tray-up sensor

- (1) Take off the feeding unit (P. 4-18 "[A] Feeding unit").
- (2) Disconnect each 1 connector of both sensors.
- (3) Release the latches and remove the feeding side paper empty sensor and tray-up sensor.

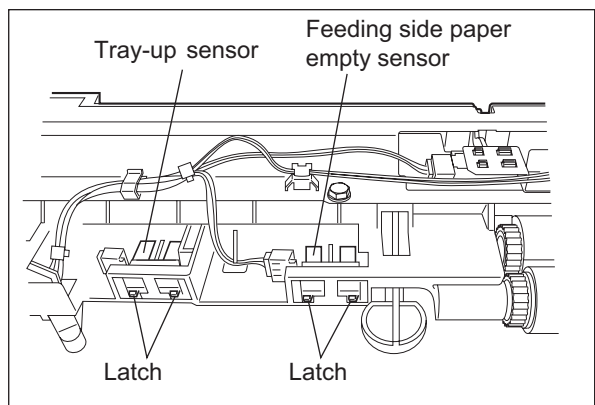


Fig. 4-38

4.13 Feeding Side Paper Stock Sensor/ Tray Bottom Sensor

- (1) Take off the LCF drawer (P. 4-2 "[A] LCF drawer").
- (2) Disconnect each 1 connector of both sensors.
- (3) Release the latch from the rear side and remove the sensors toward the front side.

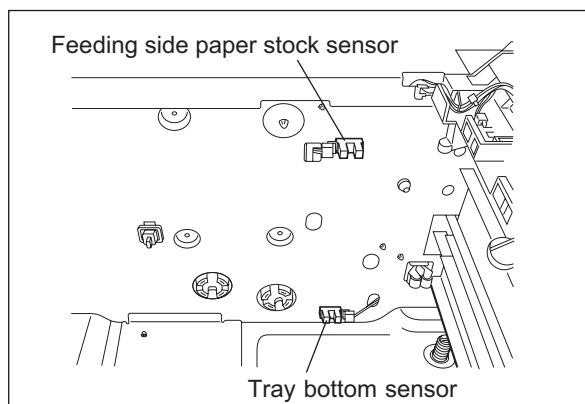


Fig. 4-39

4.14 Drawer Detection Switch

- (1) Take off the LCF drawer (P. 4-2 "[A] LCF drawer").
- (2) Take off the rear cover (P. 4-3 "[D] Rear cover").
- (3) Disconnect 1 connector. (The connector is on the rear side of the rear frame.)
- (4) Release the latch and remove the switch toward the front side.

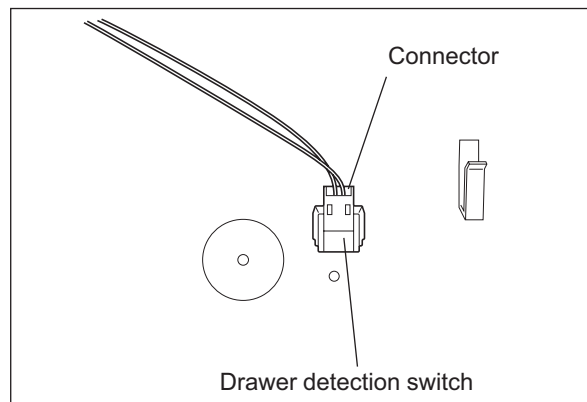



Fig. 4-40

4.15 Disassembly for PM parts

[A] Pickup roller / Feed roller

- (1) Take off the LCF drawer ( P. 4-2 "[A] LCF drawer").
- (2) Remove the clip and take off the pickup arm.
- (3) Remove the pickup roller and feed roller from the shaft.

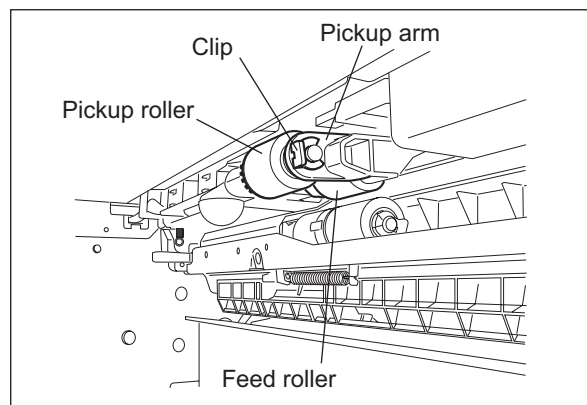


Fig. 4-41

[B] Separation roller

- (1) Open the side cover.
- (2) Remove the clip and take off the separation roller from the shaft.

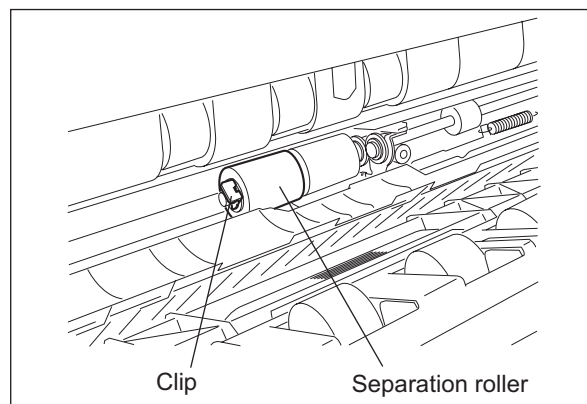


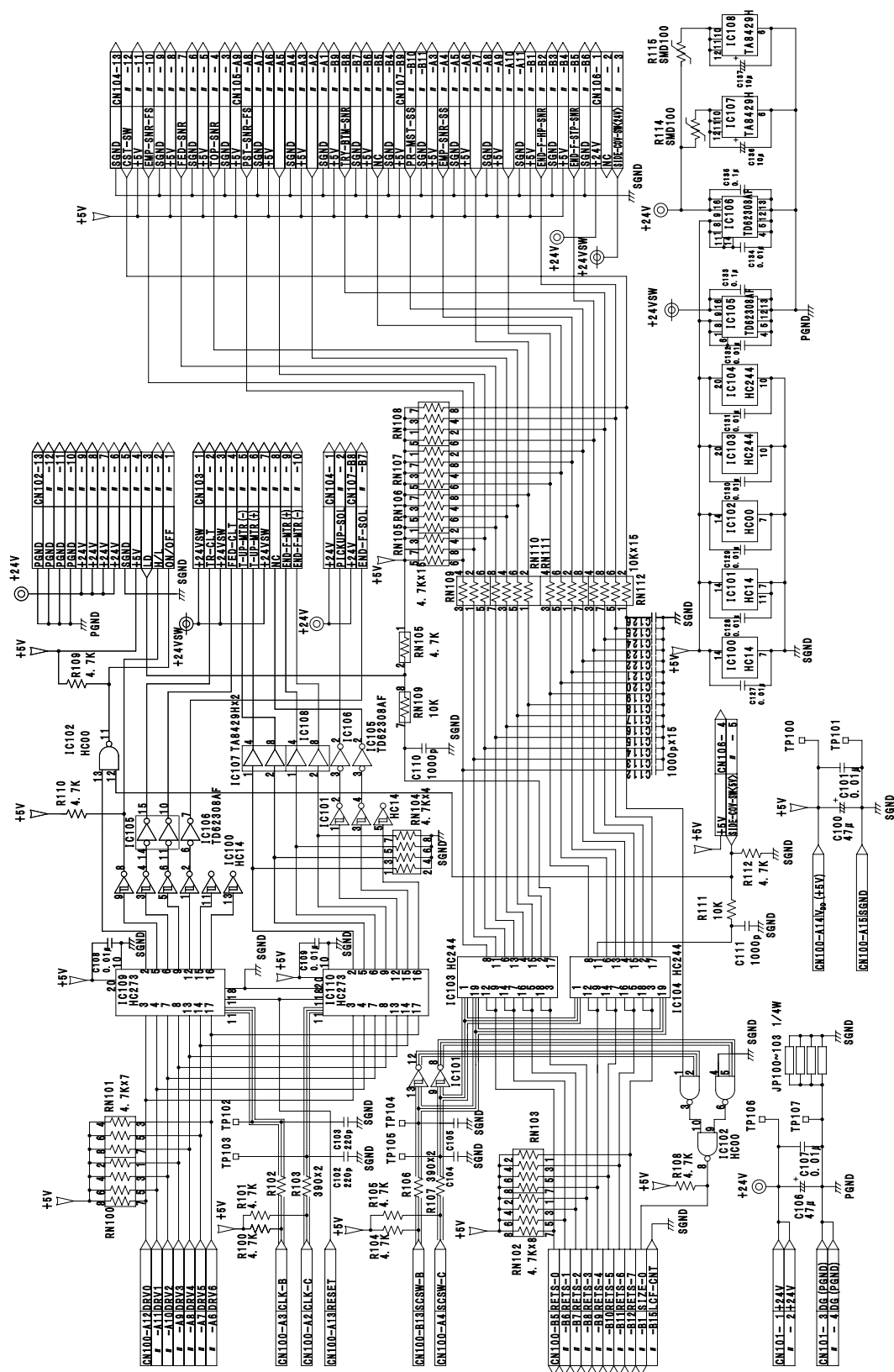
Fig. 4-42

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5.3 PC Board

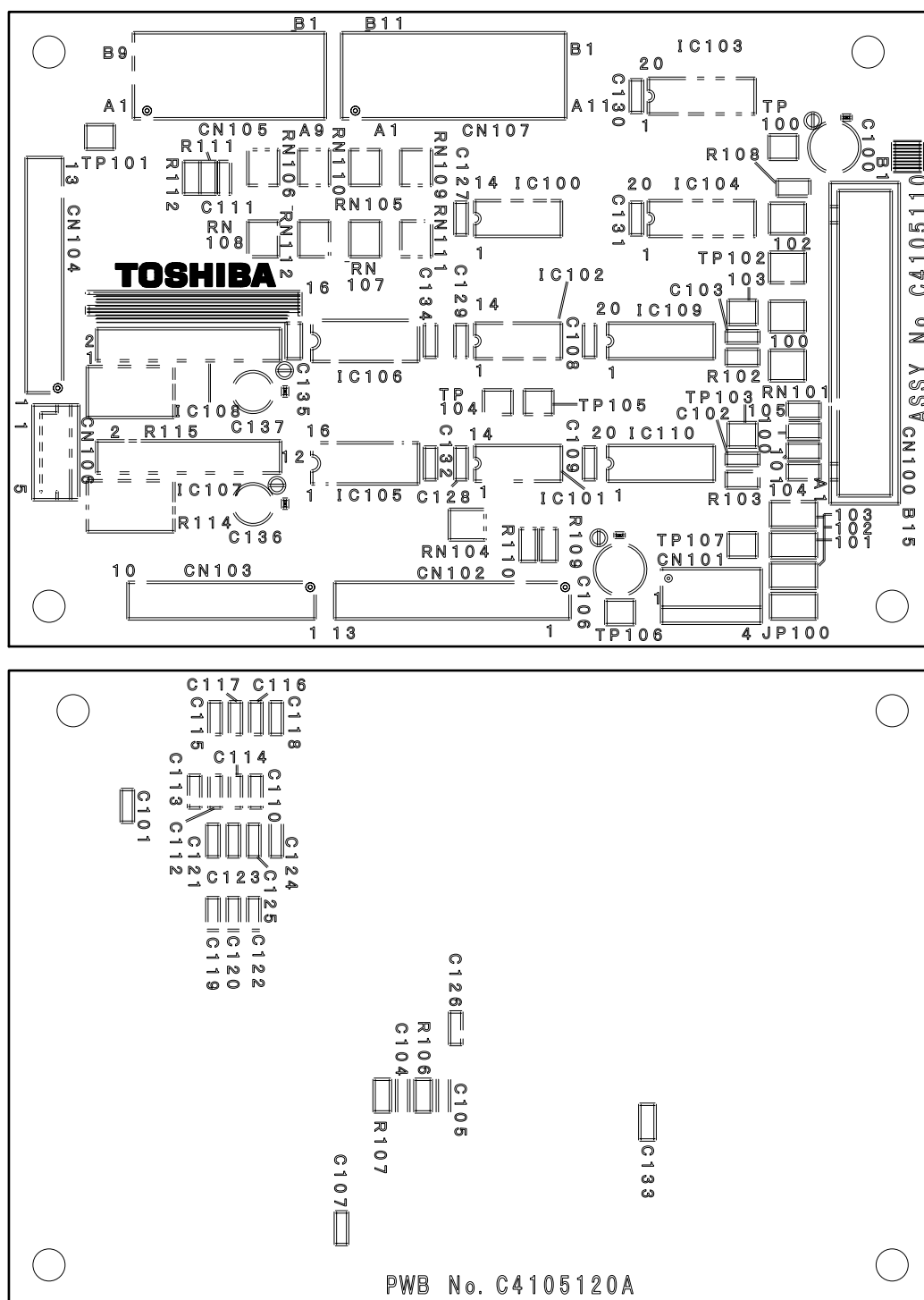


Fig. 5-4

6. PERIODIC MAINTENANCE

Symbols used in the checklist

Cleaning	Coating	Replacing	Date
A: Cleaning with alcohol	W: White grease (Molykote)	160: Every 160K copies Δ Replace if deformed or damaged	User's name
			Serial No
			Inspector's name
			Remarks

General Maintenance Checklist

Item to inspect	Cleaning	Coating	Replace every 1K copies	Remarks
Pickup roller (upper/lower)	A		160Δ	
Feed roller (upper/lower)	A		160Δ	
Separation roller (upper/lower)	A		160Δ	
Drive gears (tooth)			W	

* The above parts are to be replaced depending on the number of the sheets of paper used in the drawer.

TOSHIBA

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